

THE AFFILIATED SOCIETIES OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

IN the general report of the Brooklyn meeting of the American Association for the Advancement of Science, given in these columns on September 6, it was pointed out that a marked feature of recent meetings has been the increasing number of affiliated societies which hold meetings in connection with the Association. A useful purpose may be served by recording the communications made to these Societies.

The following papers were down in the programme of the American Mathematical Society:—Theorems in the calculus of enlargement, by Dr. Emory McClintock; on the expression of the roots of algebraic equations by means of series, by Dr. Emory McClintock; elliptic functions and the Cartesian curve, by Prof. Frank Morley; concerning the definition by a system of functional properties of the function $f(z) = \frac{\sin \pi z}{\pi}$, by Prof.

E. Hastings Moore; Bertrand's paradox and the non-Euclidean geometry, by Prof. George Bruce Halsted; analytical theory of the errors of interpolated values from numerical tables, by Prof. R. S. Woodward; upon the problem of the minimum sum of the distances of a point from given points, by Prof. V. Schlegel; on the fundamental laws of algebra, by Prof. Alexander Macfarlane; about cube numbers whose sum is a cube number, by Dr. Artemas Martin; reduction of the resultant of a binary quadric and m -ic by virtue of its semicombinant property, by Prof. Henry S. White.

The Society for the Promotion of Engineering Education had papers and discussions upon a number of interesting matters. Promoters of technical education in Great Britain will see, from the following list of subjects, that the matter is considered from many points of view in America.

Among the subjects discussed were:—Entrance requirements common to all engineering schools, by F. O. Marvin; engineering education and the State University, by W. M. S. Aldrich; text-books considered as such and not as works of reference, by C. H. Benjamin; graduate and post-graduate engineering degrees, by Palmer C. Ricketts, Geo. F. Swain, and Robert H. Thurston; teachers and text-books in mathematics for engineering students, by Mansfield Merriman; teaching engineering specifications and the law of contracts, by J. B. Johnson; teaching mechanical drawing and lettering in engineering schools, by J. J. Feather; early instruction in physics and mechanics, by C. M. Woodward; some German schools of engineering, by Storm Bull; the organisation and conduct of engineering laboratories and the equipment of the laboratories at the Massachusetts Institute of Technology, by Gaetano Lanza; electrical engineering laboratories, by D. C. Jackson.

The Civil Engineering section of the Society had papers and discussions on:—Minimum laboratory work and equipment in a civil engineering course, by Dwight Porter; a few mistakes in the conduct of college field practice, by O. V. P. Stout; the teaching of structural engineering, by Edgar Marburg; relation of practical to theoretical work in civil engineering courses, by Olin H. Landreth; the education of civil engineers for railroad service, by C. Frank Allen.

The subjects brought before the Mechanical and Electrical Engineering section were:—Mechanical laboratory work at Ames, Iowa, by G. W. Bissell; amount and kind of shop-work required in a mechanical engineering course, by C. W. Marx; teaching machine design, by J. H. Barr.

The programme of the Society for the Promotion of Agricultural Science included the vitality of seeds of red clover and of seeds of weeds, by W. J. Beal; the Russian thistle in Nebraska, by C. E. Bessey; climate in its relation to rust, by L. H. Pammel; (1) a possible relation between blights and exceptional weather; (2) notes upon field experiments, by B. D. Halsted; crimson clover, some observations in reference to methods and times of seeding, by E. B. Voorhees; the growth of lettuce as affected by the physical properties of the soil, by B. T. Galloway; cañuigre, its cultivation and preparation for market, by F. A. Gully; the effect of different fertiliser constituents upon the composition and combustibility of tobacco, by H. J. Patterson; the oil of the black walnut, by W. E. Stone; nurseries as factors in the distribution of insect pests, by J. B. Smith; Bordeaux mixture as a remedy for flea beetles on potatoes, by L. R. Jones; an inquiry into the rela-

tion existing between the Burrill disease of corn and the so-called "cornstalk disease" of cattle, by V. A. Moore; a simple milk-sampling tube, by M. A. Scovell.

The following papers were read before the Geological Society of America:—The nickel mine at Lancaster Gap, Pa., and the pyrrhotite deposit at Anthony's Nose, on the Hudson, by J. F. Kemp; a connection between the chemical and optical properties of amphiboles, by Alfred C. Lane; on a basic rock derived from granite, by C. H. Smyth, jun.; the process of segregation as illustrated in the New Jersey Highlands, by Ralph S. Tarr; alunogen and bauxite of New Mexico, with notes on the geology of the Upper Gila region, by Wm. P. Blake; a study of the cherts of Missouri, by Edmund Otis Hovey; use of the aneroid barometer in geological surveying, by Charles W. Rolfe; platynemic man in New York, by Will H. Sherzer; oil and gas in Kansas, by Erasmus Haworth; dislocations in certain portions of the Atlantic coastal plain strata and their probable causes, by Arthur Hollick; faults of the region between the Mohawk river and the Adirondack mountains, by N. H. Darton; reconstruction of the Antillean continent, by J. W. Spencer; evidences as to the change of sea-level, by N. S. Shaler; the extension of uniformitarianism to deformation, by W. J. McGee; Tertiary and early Quaternary base-leveling in Minnesota, Manitoba, and north-westward, by Warren Upham; departure of the ice-sheet from the Laurentian lakes, by Warren Upham; the drumlinoid hills near Cayuga, N.Y., by Ralph S. Tarr; drumlins in the vicinity of Geneva, N.Y., by D. F. Lincoln; channels on drumlins, caused by erosion of glacial streams, by George H. Barton; review of our knowledge of the geology of the Californian coast ranges, by Harold W. Fairbanks; the geological history of Missouri, by Arthur Winslow; the magnesian series of the North-western States, by C. W. Hall and F. W. Sardeson; the stratigraphy of the St. Louis and Warsaw formations in South-eastern Iowa, by Charles H. Gordon; the Permo-carboniferous and Permian rocks of Kansas, by Charles S. Prosser; the Trias and Jura of Shasta County, California, by James Perrin Smith; cenozoic history of a portion of the middle Atlantic slope, by N. H. Darton.

A number of papers were read before the Association of Economic Entomologists, and the president, Prof. L. O. Howard, delivered an address on "The Rise and Present Status of Official Economic Entomology."

Prominent among the Societies that met in connection with the American Association is the American Chemical Society, having a membership of nearly eight hundred. The following were among the papers read:—Recent progress in the detection of adulteration in lard, by H. W. Wiley; Uchuba fat, by Joseph F. Geisler; oxidation of non-drying oils by air, by Walter D. Field; a new and rapid method of estimating the total proteids in milk, by E. H. Bartley; inspection of cotton for use in gun-cotton manufacture, Chas. E. Munroe; ferric acid and the ferrates, by C. A. O. Rosell; some points in making molybdate of ammonia solutions for phosphorus determinations, by Charles B. Dudley; report on abbreviations of the names of metric terms used by chemists, by Wm. H. Seaman.

In the course of an interesting address delivered before the American Association of State Weather Services, Major H. H. C. Dunwoody, the acting chief of the National Weather Service, remarked that the three thousand voluntary observers who take observations of temperature and rainfall, and record miscellaneous meteorological phenomena, render it possible to supply, through the State Weather Service, climatological information for almost any locality in the United States. Nearly every county in the whole country is now provided with a station equipped with instruments of the Government standards, and if the work of establishing new stations continues during the next two years at the same rate as during the past two years, there will not be a county within the limits of America that will not have a meteorological station.

The weather crop service of the National Bureau now undoubtedly ranks next in importance to the work of making forecasts. The system of gathering reports upon which the weather crop bulletins are based has been so perfected in recent years, that further improvement in some States can scarcely be expected. The crop bulletins of the States have been improved, and are now more complete than at any previous time, and the increased circulation that these bulletins has attained amply attests their value. It is believed that there is no other

class of information to which so much space is at present devoted in the public press of America.

More than 10,000 crop correspondents are to-day co-operating with the National Weather Service through the State organisations; 3000 voluntary observers are furnishing monthly reports of daily observations of temperature and rainfall; and over 11,000 persons assist in the work of distributing the weather forecasts of the National Weather Service. This latter work has been more rapidly pushed during the past year than any other feature of State Weather Service work, and it is expected that during the ensuing year the already large number of communities receiving the Government weather forecasts will be further increased from 5000 to 6000. With a continuation of the present liberal policy of the Secretary of Agriculture and the Chief of the Weather Bureau towards these services, there will be in a comparatively short time no important agricultural community in the United States, with the proper mail facilities, that will not receive the benefits of the forecasts.

The monthly reports of many of the States are model publications of their kind. It is to be hoped that in those States where as yet the more approved methods of publishing meteorological data are not practised, means may be improved and raised to the standard attained where better facilities have been available. Uniformity in size, as far as practicable, and strictness as to tabular data, is very desirable. A daily record of temperature and rainfall for purposes of detailed investigation is most essential, and these should, if possible, form a part of each report.

The following papers were read before the American Forestry Association:—The forests of Alaska, by William H. Dall; the forests of the Shenandoah Valley, their origin and present condition, forestal areas in West Virginia, by Major Jed Hotchkiss; forests in New Jersey, by Prof. John C. Smock; the petrified forests of Arizona, by Horace C. Hovey; the Adirondack Forests, by Verplanck Colvin; the condition of our public timber-lands and forest reservations, by B. E. Fernow; what the people should learn about forestry, by Prof. Selden J. Coffin; tree-planting, by George H. Minier; forest fires in New Jersey, and some notes in methods of protection, by John Gifford; the prevention of forest fires, by General C. C. Andrews; prairie forestry, by Prof. L. H. Pammel; observations on the destructive effects of drying winds and the protection afforded by woodlands and wind breaks, by Prof. F. H. King; Does the rain-gauge settle the problem? by J. O. Barrett; the conservation of soil and water supply of hill countries in cultivated areas, by Thomas J. McKie; black walnut for economic tree-planting, by B. G. Northrup; Western pine timber-lands, by H. C. Putnam; economics in railway ties, by E. E. Russell Tratman; forest fungi and an anthracnose of the poplars, by Prof. Byron D. Halsted; the relation of insects and birds to certain forest conditions, by A. D. Hopkins.

B. E. Fernow called attention to the necessity of following up the policy begun through the efforts of the Association of reserving forest tracts of public timber-land with measures for a rational use of the same. Considerable discussion followed, resulting in the unanimous adoption of the subjoined resolution:

"Resolved, that the American Forestry Association desires to express again emphatically its approval of the efforts of the Public Lands Committee of the House of Representatives, and its chairman, the Hon. Thomas C. McRae, for the enactment of a law providing for the care and protection, not only, but for the rational use also, of the timber and other resources in the forest reservation, and on all public timber-lands. The policy of reserving can hardly be considered an advantage to the forestry interests unless followed up by an intelligent and efficient administration of the reservations, since deprived of the incidental protection. This Association emphatically denies that it advocates in the policy of forest reservations the unintelligent exclusion of large territories from actual use of the resources contained therein; but on the contrary, it reiterates that it conceives that by the reservations made for the purpose of their use—rational use—under restrictions and control which come from private interests in expectation of possible occupancy and uncared for by the rightful owner, the Government, the door is opened to greater destruction and depredation than before. We therefore desire to impress upon our representatives in Congress the urgency of making provisions for the better care of the public timber and other resources, as urged heretofore by this Association."

RECENT EXPLORATION IN BRITISH NEW GUINEA.

AT the ordinary monthly meeting of the Royal Geographical Society of Queensland, on August 20, the President (Mr. J. P. Thomson) read a paper on recent exploration in British New Guinea. The paper was a continuation of one read by the Governor at the Hobart meeting of the Australasian Association for the Advancement of Science in January, 1892. Since then several tracts of new country have been visited, and geographical knowledge of it has been increased by the detailed examination made by Sir William MacGregor of the extensive river systems of the Papuan Gulf, and his more recent exploration of the hitherto unknown parts of the north-east coast. The following extracts from Mr. Thomson's paper are reprinted from the *Brisbane Courier*.

For nearly half-a-century it had been known to geographers that several rivers existed in the neighbourhood of the Papuan Gulf. The Aird, especially, was noticed by the officers of H.M.S. *Fly* some forty-seven years ago, and more recently several channels were opened up by Mr. Theodore Bevan, whose investigations in British New Guinea were chiefly confined to this part of the country. Although these were nothing more than superficial surveys of a mere coastal fringe of the Gulf district they were the means of drawing attention to an exceedingly interesting and important part of the Possession. Here we are made acquainted with a tract of country north of the Fly estuary, cut up by almost bewildering labyrinths of tidal channels that constitute the mouths of several important rivers, which traverse enormous areas of rich agricultural as well as low, swampy, land. To intending settlers in British New Guinea this easily accessible region offers many inducements not readily met with in other parts of the Possession. Ample facilities for inland communication exist in several of the deep-water channels along the coast, while the recently explored Purari River flows through a region possessed of many attractive features of hilly and mountainous country. Along most of the watercourses native villages are thickly scattered, and these are inhabited by numerous tribes of powerful and warlike natives, who on several occasions have opposed the friendly advances of Europeans with formidable hostility. The houses, too, are truly remarkable for their large dimensions and massive architectural structure; dwellings of from 300 ft. to 400 ft. in length and over 100 ft. high being by no means uncommon. Next to the Fly the Purari is the largest river in the Possession. It enters the sea by several large channels. In the inland reaches above tidal influence it traverses some rough, hilly country, flowing almost parallel to and skirting the base of a mountain range 1500 ft. to 2500 ft. above sea level. This river was explored by Sir W. MacGregor in January and December 1893. Its average width is about 250 yards. To the north lie a range of mountains 3000 ft. to 4000 ft. high, and southerly the country is greatly broken up by low rugged hills. To the westward the main range is visible at a distance of from fifteen to twenty miles, with its bold serrated perpendicular peaks. There is very little flat land here between the hills and the mountain spurs, although sago palms are more numerous than in some parts of the country lower down the river. The geological formation consists of sandstone associated with nodules of gray limestone. At the Aure junction, some eighty miles from the sea, the Purari receives its first considerable tributary. The width of this branch is from 80 to 100 yards, with a depth of one to two fathoms. Above its junction with the tributary the Purari maintains a general course along the main mountain range, the southern spur of which it skirts very closely. Here the general character of the country, on the south side of the river, is a continuous succession of low sandstone hills, little more than 800 ft. high. These are rugged and precipitous, covered by dense forest. There are, however, no large trees. There was no appearance of any permanent native occupation in this district, and owing to its rugged nature the country did not seem adapted for European settlement. Several specks of gold were found in the bed of the river, and an important discovery of coal was also made near the island of Abukiru, in the main channel of the Purari River. As it is thought that the presence of coal in this district may greatly influence the future of the country, it has been proposed to arrange for a detailed examination of the locality. The people are bronze coloured, a few being lighter than the Port Moresby natives, and all lighter